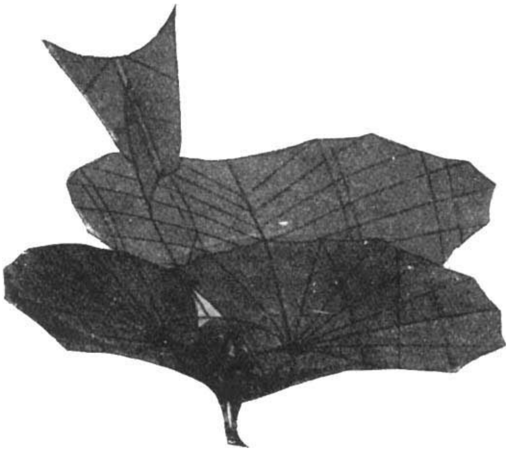
dates are not given where they are of importance, and even so well-known a worker in the field as Hargraves is practically ignored.

The illustrations are numerous, and, on the whole, are very good; of special interest is the photographic reproduction of a "double deck" Lilienthal machine in flight, which appears to be of the type used by the late Herr Lilienthal on the occasion of his last flight, when he unfortunately met with his fatal accident. Of the great variety of "birds' eye" photographs given, perhaps the most interesting are the cloud studies given in Figs. 125, 143, and 185; also a fine view of the pyramids of Egypt, Fig. 200.

The chapters on ballooning entitled "Ballooning as a Sport," "Scientific Ballooning," and "Balloon Photography," in addition to those on "Military Ballooning," make interesting reading, and constitute the most useful and trustworthy portion of the book; there is much information collected in pages devoted to these chapters that might be sought for elsewhere in vain. The account, however, is essentially of a popular kind; it is difficult to read these chapters without raising an "aëronautical appetite"; the description of over-sea ballooning and the illustrations of the de la Vaulx *deviator* are particularly interesting.



Lilienthal on his flying machine. From "Airships Past and Present."

It is when departing from the declared intention of the work that its author most lays himself open to criticism. Thus, on p. 17, in discussing the theory of the ascension of the *Montgolfiere,* there is a simple little pitfall into which the author has gratuitously precipitated himself. On the assumed barometric pressure of 30″ of mercury, it is stated (we may presume correctly) that the weight of a cubic foot of air heated to 212° F. is 0·059 lb. Herr Hildebrandt then goes on to say:—

"At a height of 8330 feet, a cubic foot of air at a temperature of 32 deg. Fahr. weighs only 0·059 lb., and therefore a 'Montgolfiere' cannot reach a greater height than this, seeing that the lift then disappears, unless the temperatures, given in the above table, can be exceeded."

The assumption made here seems to be that the air within the balloon does not expand as the pressure is relieved by altitude, just as if the air inside the balloon were contained by a hermetically sealed pressure-proof envelope.

On p. 30 a description is given of an aneroid barometer which certainly is a mistake; either the word *tube* has been used in translation instead of *diaphragm,* or else the author describes a particular aneroid (probably made by Bourdon, of Paris) instead of the aneroid as generally constructed; the almost universal practice of instrument makers is to employ a flexible diaphragm, not a tube as stated.

On p. 89 it is somewhat puzzling to find that most of the "dirigibles" have a greater content than that of their containing cylinder—according to the figures given. For example, a balloon 30 feet in diameter and 148 feet long is given as holding 137,500 cubic feet of gas; in view of the fact that a cylinder of these dimensions has a volume of only 105,000 cubic feet, this requires some explanation. Several other cases are equally incomprehensible.

On p. 96 the year 1862 is assigned to Phillips's "venetian blind" captive machine; this appears to be an error of about thirty years (antedate).

The fatal accident to Herr Lilienthal is stated to have been due to a want of adjustment, the machine turning over at a height of 50 feet from the ground. The authority for this version of the accident should be stated; the account, as published in NATURE (September 3, 1896), contributed by Prof. Carl Runge, from the evidence of an eye-witness (the assistant of Herr Lilienthal), made no mention of any error of adjustment, but attributed the capsize to a sudden gust, which carried the machine to a height of 30 metres (100 feet), from which the fatal plunge took place.

In the chapter on carrier pigeons an account of certain experiments, stated to have been made with trained swallows, is given, but again no trustworthy authority is mentioned. A passage may be quoted as follows:—"An Antwerp trainer sent up some swallows and pigeons at the same time at Compiègne, in France. The pigeons covered the distance of 145 miles in 3¾ hours, while the swallows arrived in 1 hour 7 minutes; the speed of the latter was therefore three times that of the former." Now the time taken by the pigeons appears to denote that there was no wind of consequence, and therefore the velocity of flight of a swallow may be calculated as 130 miles per hour, a conclusion full of improbability. Statements of this kind should only be inserted in a serious work after careful verification, and with the authority stated, place and time also being given, if possible.

NOTES.

THE fourth International Congress of Mathematicians was opened at Rome on Monday, April 6, in the presence of King Victor Emmanuel II., and the proceedings concluded on Saturday last, when an invitation was accepted to hold the congress of 1912 at Cambridge. The number of members shows a considerable increase on that of previous congresses, and a great deal of valuable work has been done in the sections. The Guccia medal has been awarded to Prof. Francesco Severi, for his papers on the geometry of algebraic surfaces. We hope to give an account of the proceedings of the congress next week.

IT was announced at the meeting of the Institution of Naval Architects on April 8 that the council had gratefully accepted an offer from Mr. A. F. Yarrow, vice-president of the institution, to defray the cost, up to 20,000*l*., of an experimental tank for research purposes to be erected at the National Physical Laboratory, provided that cost of maintenance for the first ten years was assured. A committee is to be appointed to carry out the scheme. Papers on the employment of the steam turbine for various classes of ships took a prominent place in the proceedings of the meeting. Lord Cawdor was elected president of the institution upon the retirement of Lord Glasgow.

THE annual conversazione of the Selborne Society will be held at Burlington Gardens, New Bond Street, W., on Friday, May 1, from 7.30 to 11 p.m.

THE death is announced, in his eighty-seventh year, of Prof. Franz von Leydig, of the University of Bonn, distinguished by his studies in comparative histology and various works upon anatomical subjects.

MR. J. P. JOHNSON, of Johannesburg, has been commissioned by the Government of Orange River Colony to investigate and report on the Bushmen sculptures and paintings in that territory.

AT Issy les Moulineaux on March 11, M. Delagrange, mounted upon an aëroplane, traversed the marked circuit seven times, the total distance being about 10 kilometres, in 9m. 15s. The motor with which M. Delagrange's machine is provided is a forty horse-power light cylinder Antoinette.

THE Town Council of West Ham has resolved to confer the freedom of the borough on Lord Lister, "who was born in the county borough, and has rendered such illustrious service to the human race by his famous discovery of the antiseptic system of treatment in surgery and in a variety of other ways connected with science and the alleviation of pain and suffering."

REUTER'S Agency learns that the British Government has decided to take independent action regarding sleeping sickness by establishing a National Sleeping Sickness Bureau with headquarters in London. It will be remembered that the recent international conference in London collapsed mainly owing to the opposition offered to the proposal to establish any international bureau in London. Alternative recommendations in favour of Paris and Brussels were put forward at the time, but no agreement was come to on the question. The British National Bureau will be managed by a strong committee. Annual grants will be made by the Imperial and Sudanese Governments. To combat sleeping sickness, Great Britain and Germany are concluding a convention on the subject of joint measures for the prevention of the malady in Uganda and German East Africa. This is expected to be signed at an early date.

THE Naples Table Association for Promoting Laboratory Research by Women announces the offer of a fourth prize of one thousand dollars for the best thesis written by a woman, on a scientific subject, embodying new observations and new conclusions based on an independent laboratory research in biological, chemical, or physical science. The theses offered in competition are to be presented to the executive committee of the association, and must be in the hands of the chairman of the committee on the prize, Mrs. Ellen H. Richards, Massachusetts Institute of Technology, Boston, Mass., before February 25, 1909. The prize will be awarded at the annual meeting in April, 1909. The papers presented will be judged by a board of examiners, or by such specialists as they may choose. The board of examiners is constituted as follows:—*Biological sciences*, Dr. W. H. Howell, Johns Hopkins Medical School; *chemical sciences*, Dr. T. W. Richards, Harvard University; *physical sciences*, Dr. A. A. Michelson, University of Chicago.

WE have received a somewhat belated copy (published in 1906) of No. 26 of the *North American Fauna*—U.S. Department of Agriculture—in which Mr. A. H. Howell classifies the little skunks of the genus Spilogale.

To Nos. 3 and 4 of vol. xxix. of Notes from the Leyden Museum, Dr. E. D. van Oort contributes two papers on Papuan birds, in the second of which he describes, under the name of ***Casuarius casuarius bistriatus***, an apparently new race of cassowary from the north coast of New Guinea. It is remarkable that this bird appears to be related to an Aru Island species, and thus quite different from those inhabiting the interior of New Guinea. A coloured plate of the head and neck is given.

To *British Birds* for April Messrs. Witherby and Ticehurst contribute an article on the spread of the little owl in England. This owl cannot now be regarded otherwise than as an introduced species in England, owing to the fact that so many have been turned loose in various parts of the country. The process began in 1843 at Walton Park, Yorkshire, but the chief centres of spread have in recent years been Hampshire, Tring, Edenbridge in Kent, and Oundle. From Oundle the birds appear to have reached Woburn, where they breed freely. They also breed near Watford and other parts of Hertfordshire, while from the Kent centre these owls have colonised a considerable portion of the south-east of England.

IN an article on the seasonal colour-change in birds, published in the January number of the *American Naturalist*, Mr. C. W. Beebe states that certain tanagers and bobolinks, which had been prevented from breeding, were kept during autumn in a darkened chamber with a somewhat increased supply of food. The consequence was that the brilliant breeding-plumage was retained throughout the winter. Early in the following spring the birds were returned to normal conditions, and speedily moulted. The new plumage was, however, the nuptial dress, and not the dull winter livery, which was skipped. The sequence of plumage-change is not, therefore, invariable, but evidently in some degree dependent on external factors in the environment.

THE faculty of orientating their position, or the sense of direction, is considered by Mr. Benjamin Kidd, in the April number of the *Century Illustrated Magazine*, to be the most remarkable phenomenon in animal instinct. "This faculty of judging direction seems to bear no relation to the place of the animal in the general scale of intelligence. It is possessed to a considerable degree by dogs and cats, but in a very high degree by seals, which find their way back year after year to their rookeries from enormous distances in the open sea. It reaches a high degree of perfection in migratory birds not otherwise noted for intelligence. . . . The turtles which annually visit Ascension Island to deposit their eggs afford another example of the perfection of this instinct. How these reptiles can find this comparatively small speck of land in the midst of a vast ocean is, with our present knowledge, unaccountable."

Two pamphlets dealing with the food of American birds have just come to hand. In the first of these (from the Year-book of the U.S. Agricultural Department for 1906), Mr. W. L. McAtee gives a list of species feeding upon scale-insects, among which those included in the States under the name of grosbeaks occupy a prominent position. According to the second paper, which is by the same author, and forms Bulletin No. 32 of the Bureau of the Biological Survey, the birds last-named are valuable in other respects to the agriculturist and horticulturist. It should be mentioned that in America the scarlet cardinal and other members of the genus Cardinalis are commonly termed grosbeaks, and it is to this group that the remarks of the author apply. These birds are much less exclusively vegetarians than other members of the finch tribe, nearly half their food-supply consisting of animal substances. Moreover, the five species discussed in the pamphlet consume, on the average, nine times more wild seeds than grain and fruit, while the proportion of noxious to useful insects devoured by them is nineteen to one. Cardinal grosbeaks and their relatives are, therefore (after due allowance is made for certain injuries they inflict), of great economic value to the farmer, by whom they ought to be encouraged and protected.

We offer our congratulations and best wishes for a successful life to the Transvaal Biological Society, the first meeting of which was held at the Transvaal Museum, Pretoria, on January 17, Dr. Theiler, C.M.G., being in the chair. We are unable to find space for descriptions of the papers read at the opening meeting, but the titles are given among our reports of societies and academies. The honorary secretary and treasurer of the society is Dr. L. H. Gough.

An account of the sporangium in the Ophioglossaceæ, contributed by Mr. L. L. Burlingame to the *Botanical Gazette* (July, 1907), is based on an examination of the middle and later stages of development of the sporangium of *Ophioglossum reticulatum*. Irregular divisions of the sporogenous tissue, a remarkable difference in the stages of division of the mother cells, and an absence of definite arrangement in the positions of nuclear spindles in adjacent cells, were the chief points brought out in the investigation. A multipolar spindle changing to a tripolar, and subsequently to a bipolar, condition is figured. The development of the sporangia in the three genera Ophioglossum, Botrychium, and Helminthostachys is collated in tabular form.

Dr. H. von Schrenk communicates to the report of the Missouri Garden for 1907 two interesting notes on growth connected with natural injuries to trees. In the one case sycamore buds were caught by the late frosts, with the result that the outer buds on the branches were killed, but the lower buds survived, and there was also a well-marked development of adventitious buds. The second note refers to hollow or button-like branch cankers formed on shrubs of *Rhododendron maximum* as a consequence of the slow growth of the healing callus tissue. Mr. H. Hus records his experiments on the germination of *Hydrastis canadensis*, a sylvestral plant yielding rhizomes that are officinal in certain pharmacopœias. The same author instances a case of virescence in the petals of *Oxalis stricta*, and mentions that the character was transmitted to the second generation.

The annual report of the botanic station, agricultural school, and experiment plots in Dominica contains also an account of the inception and development of these establishments, and illustrations of local views. In Dominica much attention has been paid to the cultivation of limes; the establishment of a spineless variety of the fruit, and the introduction of the system of manufacturing citrate of lime for export, are expected to improve the industry. The characters of the spineless lime and the qualities of the juice are compared with those of the ordinary variety. Another feature has been the dissemination of the value of budding and grafting; in this connection, experiments in grafting cacao are noteworthy; training in these methods forms a part of the curriculum provided at the agricultural station. The manurial experiments on cacao plots indicate that various manures may be profitably applied, but the best results were obtained with mulchings of grass and lawn sweepings.

A revised list of the flora of Natal, compiled by Mr. J. M. Wood, has been published in the eighteenth volume (part ii.) of the Transactions of the South African Philosophical Society. The preponderance of the order Compositæ is very marked, and is partly due to the numerous species of Helichrysum, Senecio, Berkheya, and Vernonia. The next largest orders are the Gramineæ and Leguminosæ, then the Liliaceæ and Orchidaceæ. The genera Crassula, Indigofera, Royena, Selago, and Mahernia are well represented. The author recognises three botanical regions, and alludes to the palms *Hyphaene crinita* and *Phoenix reclinata, Strelitzia augusta*, and the handsome shade tree, *Trichilia Dregeana*, that grow in the coastal region. In the midlands the hills are grass-clad, and the forests are generally confined to the valleys, where two species of Podocarpus and *Ocotea bullata* occur. In the uplands, *Callitris cupressoides*—one of the three conifers indigenous to the country—forms isolated forests; two plants with conspicuous flowers are *Ranunculus Cooperi* and *Anemone Fanninii*, and the well-known *Galtonia candicans* is found.

In the *Reliquary* for April, a noteworthy article is that by Mr. E. D. Goddard on certain fibulæ of the La Tène type found in Wiltshire, which may be dated about 200 B.C. This is a useful supplement to the discussions on the same subject by General Pitt-Rivers, Prof. Ridgeway, Mr. Reginald Smith, Dr. Arthur Evans, and others. The writer traces twenty-six examples found in England, of which Wiltshire and the adjoining counties claim no fewer than twenty—a fact which he thinks may imply a special connection of this part of England with Gaul in the period preceding the Roman invasion. In the same number Mr. J. L. Cowan contributes a well-illustrated article showing the evolution of house building in the Pueblo region of New Mexico, Arizona, Utah, and Colorado.

The Observatory of Rio de Janeiro is doing very useful work in collecting and publishing in its *Boletim Mensal* series of meteorological observations made at various places in Brazil. In the number for January-March, 1907, which we have recently received, are to be found—in addition to the current tri-hourly observations at the observatory and ten-day means for other stations—monthly and annual summaries referring to several departments for 1906. Monthly and annual rainfall values are also given for Recife (Pernambuco) for fifty-four separate years between 1842 and 1906.

A copy has just reached us of the observations made at the Royal Magnetical and Meteorological Observatory at Batavia in 1905; the principal change for this year is the omission of the hourly values of atmospheric humidity. In this valuable series of hourly readings the meteorological observations date from 1866, the magnetical from 1868; in both of these elements the influence of the moon has been taken into account. The seismometrical observations date from 1898. The present volume includes the results of meteorological observations for 1901–5, and for 1866–1905; we also note that a discussion of the rainfall at 700 stations in the archipelago is in the press. Three important appendices accompany the volume; one of these gives a list of magnetic disturbances during 1880–1899; some of the statistical results have been published by the Amsterdam Academy. We hope to refer to the others, dealing with meteorological subjects, later on.

The Survey Department of the Ministry of Finance of Egypt has issued an account of the magnetic observations made in Egypt during the ten years 1895–1905, together with a summary of the observations made previously in northern Africa. According to the charts which embody the results, the declination at Alexandria has decreased from 13° to 3° west, and the dip from 47° to 42°, in the last 100 years. The lines of equal declination at present run nearly parallel to the Red Sea, where the declination is 2°. At the Victoria Nyanza it is 7°. The lines of equal dip run east and west, the dip being 43° north at Port Said and 23° south at the Victoria Nyanza. The horizontal force varies from 0·30 at Cairo to 0·35 at Aden, and the curves of equal force are not unlike ellipses with their major axes east and west and their centres in the Gulf of Aden.

A paper on "The Possibility of a Topography of the Air, based on Balloon Observations with Special Theodolites," by Captain C. H. Ley, appears in the last issue of the Quarterly Journal of the Royal Meteorological Society (vol. xxxiv., No. 145). The paper forms a further contribution to the investigation of the upper atmosphere, which now plays so important a part in meteorological work. In all experiments hitherto made to determine the motion of the upper air from the drift of pilot balloons, it has been necessary either to observe the motion of the balloon through two theodolites at either end of a measured base line, or, if only one theodolite was available, to assume a value for the upward velocity of the balloon. In the present experiments only one theodolite was used, and the remaining data necessary for determining successive positions of the balloon were obtained from measurements of its apparent diameter made with a special arrangement of cross-wires in the eye-piece. Allowance was made for the expansion of the balloon by assuming approximate values for the rate of decrease of temperature and pressure with height, and calculating the volume of the balloon from the usual laws for the expansion of gases. The experimental and other difficulties which arise are considerable, and it can hardly be claimed that the author has succeeded in overcoming them completely, but the advantages of a method which dispenses with a second theodolite are considerable, and it is to be hoped that the experiments will be continued. The results obtained go to show that the ascensional velocity of a pilot balloon is far from uniform, as is generally assumed in experiments with only one theodolite. The most striking variations were found to occur as the balloon passed over a ridge of hills. In the vast majority of cases, when this occurred a marked increase in the rate of ascent was observed as the balloon approached the ridge, even though it was at an altitude of several thousand feet above the summit. The increase in the rate of ascent of the balloon is regarded as direct evidence of an increase in the vertical component of the motion of the air in which it floats, so that the topography of the land appears to have a close connection with the vertical motion of the air even up to altitudes of 20,000 feet.

Some excellent photographs and drawings of the new Charing Cross Station of the South-Eastern and Chatham Railway are given by Mr. C. S. Lake in *L'Ingegneria Ferroviaria* of March 16. It is noted that the quantity of steel used in the construction of the new roof was 1000 tons.

The School of Mines at Golden, Colorado, with 329 students, possesses exceptional environment for mining and metallurgy, and the current issue of the school Bulletin (vol. iv., No. 2), published semi-annually by the Technical and Engineering Society, affords evidence that excellent work is being done by the students. Mr. F. H. Cronin gives an outline of the course in steam-power plant design. Mr. D. Hollis and others contribute an admirable paper on the electrometallurgical treatment of copper slimes, and Mr. C. D. Test gives an account of the occurrence, production, and commercial value of monazite.

An important contribution to the knowledge of the economic geology of Peru is afforded by a monograph, by Mr. Enrique I. Dueñas, on the mineral resources of the department of the Cuzco, forming *Boletin* No. 53 of the Corps of Peruvian Mining Engineers. Descriptions are given of the gold washings of the river Nusiniscato, of the nickel and cobalt ore deposits of Vilcabamba, of the Silurian gold veins in Paucartambo, of the oil fields of Pallpata and Pusi, of the Tertiary and Mesozoic coalfields of the department, of the iron-ore deposits of Chumbivilcas, and of veins of copper sulphide, argentiferous galena, gold quartz, and stibnite in various parts of the department. The occurrence of mica in pegmatite dykes, of asbestos, of tripoli, and of other non-metallic minerals of economic value is also recorded.

At the Institution of Mechanical Engineers on March 27, papers were read by Dr. F. J. Brislee on combustion processes in English locomotive fire-boxes, and by Mr. L. H. Fry on combustion and heat balances in locomotives. Dr. Brislee's object was to ascertain what percentage of carbonic oxide escaped unburned, and to this end he carried out interesting trials on the London and North-Western Railway. Mr. Fry gave selections from the data published in "Locomotive Tests and Exhibits, Pennsylvania Railroad," at the St. Louis Exhibition, a book which was issued in 1905. Both papers represent a great deal of labour, and the carefully tabulated experimental results will undoubtedly prove of permanent value, although it is doubtful whether either paper is likely to affect locomotive practice.

At the last meeting of the Institution of Engineers and Shipbuilders in Scotland, Mr. M. Kahn read a paper on the practical application of reinforced concrete. He expressed the opinion that reinforced concrete was the best form of construction when properly handled, and the worst when improperly handled. Such being the case, it behoves the owner and the architect to ensure that only the best class of contractor is employed on his work. Contractors can only afford to carry out work which will ensure them a fair amount of profit, and if, by the adoption of reinforced concrete, the owner is saved 10 per cent. of the cost of construction, it is advisable to grant the contractor any extra saving, so as to ensure his giving a construction which will prove satisfactory in every respect. When owners and engineers realise this point, and act accordingly, reinforced concrete will then reach that position in the category of structural materials where it justly belongs.

The preliminary official report on the mineral production of Canada in 1907 shows that the total value of the output was 86,183,477 dollars, the largest total ever reached. Compared with the production of the previous year, there are some decreases to record, such, for instance, as in gold and lead, in corundum, felspar, and graphite, but these are more than counterbalanced by large increases in the production of pig iron, silver, asbestos, coal, natural gas, petroleum, and cement.

A report on the work and results of the Khatanga Expedition, organised in 1905 by Dr. F. Schmidt, with the cooperation of the Russian Geographical Society, appears in the February number of *La Géographie*. The work of the expedition was divided into three sections—the exploration of the higher course of the Khatanga, and its relations with the tributaries of the Yenisei; the discovery of the main features of the lake region, and the course of the Moiero; and, finally, the exploration of the extreme north of the Khatanga and Anabar. A map of the Khatanga and its upper branches shows the important additions to geographical knowledge resulting from the expedition, which has proved that the supposed immense lakes of that district do not exist. In addition, geological information of great interest has been obtained, together with important zoological and ethnographic collections.

Prof. Aristide Fiorentino, writing in the *Rendiconti* of the Lombardy Academy, directs attention to a school-room experiment for showing the absorption of energy by an acoustic resonator. He places the resonator in the neighbourhood of a singing flame, and if the two are in unison the vibrations of the flame instantly cease. The author has further used the singing flame as a test for syntonised resonation. Thus he has demonstrated in the case of a gramophone horn that those tones are most readily absorbed which are most strongly reinforced. The failure to take account of this fact is no doubt partly the reason why gramophone reproductions usually represent little more than a caricature of the original music. The same records are habitually snorted out through horns of all sizes and shapes, whereas if the free vibrations of any particular horn were reduced by the absorbing action of similar horns in the manufacture of the records, the results would be much better.

Himmel und Erde for March contains the report of a popular lecture on electric transmission of power to great distances, delivered by Prof. H. Görges, of Dresden, before the Scientific Association of Berlin. The lecturer deals in a clear manner with the generation of electric current by the motion of a conductor through a magnetic field, and shows how the modern dynamo is merely an application of this principle. The generation of the power to drive the machines is also treated, special attention being given to the utilisation of the waste gases from blast furnaces and to water power. Prof. Görges believes that the greatest future lies open to the simple alternating as distinguished from the triphase current, and instances the recent installation of the Ohlsdorf-Hamburg-Blankenese electric railway as a step in this direction. The pressure in this case is 6000 volts, with 30,000 for transmission to distant portions of the line.

The London Geological Field Class excursions, conducted by Prof. H. G. Seeley, F.R.S., for the study of the Thames Basin, will commence on Saturday, May 9. Mr. J. W. Jarvis, St. Mark's College, Chelsea, S.W., is the honorary secretary.

A second edition of the "Guide to the Archives of the Government of the United States in Washington," by Messrs. C. H. V. Tyne and W. G. Leland, has been published by the Carnegie Institution of Washington. The new issue has been revised and enlarged by Mr. W. G. Leland; the usual work of correcting errors, verifying statements, supplementing the bibliographical data, altering classification when required by administrative changes, and bringing the accounts to date, has been performed, and in several cases the text has been much amplified.

OUR ASTRONOMICAL COLUMN.

The Recently Discovered Satellite of Jupiter.—The observations made at Greenwich of the object near Jupiter, recently discovered by Mr. Melotte, tend to confirm the assumption that this object is in reality a satellite, the eighth of the known Jovian satellites.

In the April number of the *Observatory* (No. 395, p. 177) there appears a note which states that the observed positions, from January 27 to March 23, may be satisfied by the assumption that the satellite has a retrograde motion; the pole of the orbit plane lies in R.A.=334° 48′, N. dec.=56° 44′; distance from Jupiter 0·24 astronomical unit; daily motion about Jupiter, 0°·266. On February 18 it passed the minor axis of the apparent ellipse. The arc yet observed is so small that any solution can only be tentative, but it is hoped that sufficient observational material has been gathered to ensure the re-discovery of the satellite at the next favourable presentation.

Mutual Occultations and Eclipses of Jupiter's Satellites.—A partial occultation of Ganymede by Europa was observed by Mr. Whitmell on January 25, the phenomenon lasting for some fifteen minutes. Prof. Oudeman recently published some ephemerides for occultations to take place in June next, but in No. 395 of the *Observatory* (April, p. 178) there appears a list of times at which occultations will take place during the present month. In the following extract the first Roman figure indicates the eclipsed, the second the eclipsing, satellite:—April 17d. 10h. 41m., II., III.; 17d. 14h. 17m., II., I.; 21d. 12h. 19m., IV., II.; 22d. 9h. 41m., IV., III.; 22d. 11h. 27m., I., II.; 28d. 13h. 29m., IV., III.

The Transit of Mercury, November, 1907.—In No. 4238 of the *Astronomische Nachrichten* (March 9, p. 218) M. Gautier records the results of the observations made, at the Geneva Observatory, of the recent transit of Mercury. Neither the bright outer ring nor the central luminous spot was observed at any time during the transit. Times of the contacts and the positions of Mercury referred to the sun's limb at different times during the transit are given, and it is recorded that M. Pidoux, using the Plantamour equatorial of 271 mm. aperture, found the apparent diameter of the planet's disc to be 8″·4, an amount sensibly less than that given by the ephemerides.

Parallax Observations.—The results of various parallax observations made by Dr. Karl Bohlin at the Stockholm Observatory appear in No. 4240 of the *Astronomische Nachrichten* (March 23, p. 247). The first object considered is a nebula, G.C. 1532, and the second an adjacent star, Lalande 14512. Their respective parallaxes are −0″·036 and −0″·058, the Brünnow relative corrections for the aberration constant being +0″·186 and +0″·149 respectively, corrections to which Dr. Bohlin directs especial attention on account of their magnitude. The corresponding figures for Bossert 947 (=Lalande 18115) and 61 Cygni are +0″·085 and +0″·363 for the parallaxes, and +0″·102 and +0″·048 for the corrections.

Astronomical Photography with Portrait Lenses.—Some good examples of celestial pictures taken with portrait lenses are reproduced in No. 187, vol. xlvi., of the Proceedings of the American Philosophical Society (October-December, 1907, p. 417), in order to illustrate a paper by Prof. Barnard on the subject of astronomical photography. Prof. Barnard, in the first place, discusses the great advantages accruing from photography in the correct delineation of celestial objects, and then points out the special suitability of the earlier portrait lenses of large aperture for this purpose. This is followed by a discussion of each of the objects shown, including nebulæ, star clusters, meteor trails, comets, &c. Most of the pictures were taken with the 10-inch Brashear doublet of the Bruce telescope.

The Harvard College Observatory.—Prof. Pickering's report of the work done at the Harvard College Observatory during the year ended September 30, 1907, is the sixty-second of its series, and contains the usual brief summary of an immense amount of work. With the 11-inch Draper telescope, 356 photographs were secured, making 17,035 in all, and with the 8-inch Draper telescope the taking of 611 photographs brought the total to 34,886. The spectra of 456 stars, taken with the 11-inch instrument, were studied and classified by Miss Cannon, thus bringing near to completion a catalogue of the spectra of more than 1200 stars north of declination −30°. 2710 stellar photographs were taken at Arequipa, the total numbers now taken with the 13-inch Boyden and 8-inch Bache telescopes being 11,847 and 38,224 respectively. Other results, too numerous to mention here, are contained in the report, and it is announced that to private